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## Claims:

1. A data transfer system for transferring control information from a control terminal to a target through a data transmission network including at least one data transmission equipment working in a predetermined communication protocol, wherein

each of said at least one data transmission equipment comprises:

a receiving section for receiving a transmission signal including control information from upstream;

a transmitting section for transmitting a transmission signal including control information to downstream; and

a forwarding section for forwarding control information included in a received transmission signal to the transmitting section without controlling the control information according to the predetermined communication protocol.

2. The data transfer system according to claim 1, wherein the forwarding section comprises:

a data extractor for extracting the control information from the received transmission signal; and

a data inserter for inserting the extracted control

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information into a predetermined one of a first location and a second location of the transmission signal to be transmitted.

3. The data transfer system according to claim 2,  
wherein the first location is data communication channel (DCC)  
5 bytes of the transmission signal and the second location is  
DCC transmit bytes that are previously determined in the  
transmission signal.

4. The data transfer system according to claim 3,  
wherein  
10 the data extractor extracts the control information  
from the first location of the received transmission signal;  
and

the data inserter inserts the extracted control  
information into the second location.

15 5. The data transfer system according to claim 3,  
wherein  
the data extractor extracts the control information  
from the second location of the received transmission signal;  
and

20 the data inserter inserts the extracted control  
information into the second location.

6. The data transfer system according to claim 3,

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wherein

the data extractor extracts the control information from the second location of the received transmission signal; and

5 the data inserter inserts the extracted control information into the first location.

7. The data transfer system according to claim 1, wherein the forwarding section further comprises:

a data extractor for extracting the control  
10 information from the received transmission signal;

a first data inserter for inserting the extracted control information into a first location of the transmission signal to be transmitted;

a second data inserter for inserting the extracted  
15 control information into a second location of the transmission signal to be transmitted; and

a switch for forwarding the extracted control information to a selected one of the first and second data inserters depending on predetermined control information.

20 8. The data transfer system according to claim 4, wherein an upstream data transmission equipment works in a different communication protocol and a downstream data transmission equipment works in the predetermined communication protocol.

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9. The data transfer system according to claim 5, wherein both an upstream data transmission equipment and a downstream data transmission equipment work in the predetermined communication protocol.

5 10. The data transfer system according to claim 6, wherein an upstream data transmission equipment works in the predetermined communication protocol and a downstream data transmission equipment works in a different communication protocol.

10 11. The data transfer system according to claim 1, wherein the data transmission network is composed of data transmission equipments working in the predetermined communication protocol.

12. The data transfer system according to claim 3,  
15 wherein bytes that are not used in the transmission signal are assigned to the DCC transmit bytes.

13. A data transmission apparatus in a data transfer system for transferring control information from a control terminal to a target through a data transmission network, wherein  
20 the data transmission apparatus works in a predetermined communication protocol, comprising:

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a receiving section for receiving a transmission signal including control information from upstream;

a transmitting section for transmitting a transmission signal including control information to

5 downstream; and

a forwarding section for forwarding control information included in a received transmission signal to the transmitting section without controlling the control information according to the predetermined communication  
10 protocol.

14. The data transmission apparatus according to claim 13, wherein the forwarding section comprises:

a data extractor for extracting the control information from the received transmission signal; and

15 a data inserter for inserting the extracted control information into a predetermined one of a first location and a second location of the transmission signal to be transmitted.

15. The data transmission apparatus according to claim 14, wherein the first location is data communication channel  
20 (DCC) bytes of the transmission signal and the second location is DCC transmit bytes that are previously determined in the transmission signal.

16. The data transmission apparatus according to claim

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15, wherein

the data extractor extracts the control information  
from the first location of the received transmission signal;  
and

5 the data inserter inserts the extracted control  
information into the second location.

17. The data transmission apparatus according to claim  
15, wherein

the data extractor extracts the control information  
10 from the second location of the received transmission signal;  
and

the data inserter inserts the extracted control  
information into the second location.

15 18. The data transmission apparatus according to claim  
15, wherein

the data extractor extracts the control information  
from the second location of the received transmission signal;  
and

20 the data inserter inserts the extracted control  
information into the first location.

19. The data transmission apparatus according to claim  
13, wherein the forwarding section further comprises:

a data extractor for extracting the control

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information from the received transmission signal;

a first data inserter for inserting the extracted control information into a first location of the transmission signal to be transmitted;

5 a second data inserter for inserting the extracted control information into a second location of the transmission signal to be transmitted; and

a switch for forwarding the extracted control information to a selected one of the first and second data  
10 inserters depending on predetermined control information.

20. A data transfer method for transferring control information from a control terminal to a target through a data transmission network including at least one data transmission equipment working in a predetermined communication protocol,  
15 comprising:

at each of said at least one data transmission equipment,

a) receiving a transmission signal including control information at a receiving section from upstream;

20 b) forwarding control information included in a received transmission signal to a transmitting section without controlling the control information according to the predetermined communication protocol; and

c) transmitting a transmission signal including the  
25 control information from the transmitting section to

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downstream.

21. The data transfer method according to claim 20,  
wherein the step b) comprises:

5 b.1) extracting the control information from the  
received transmission signal; and

b.2) inserting the extracted control information  
into a predetermined one of a first location and a second location  
of the transmission signal to be transmitted.

22. The data transfer method according to claim 21,  
10 wherein the first location is data communication channel (DCC)  
bytes of the transmission signal and the second location is  
DCC transmit bytes that are previously determined in the  
transmission signal.

23. The data transfer method according to claim 22,  
15 wherein

in the step b.1), the control information is  
extracted from the first location of the received transmission  
signal; and

in the step b.2), the extracted control information  
20 is inserted into the second location.

24. The data transfer method according to claim 22,  
wherein



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in the step b.1), the control information is  
extracted from the second location of the received transmission  
signal; and

in the step b.2), the extracted control information  
5 is inserted into the second location.

25. The data transfer method according to claim 22,  
wherein

in the step b.1), the control information is  
10 extracted from the second location of the received transmission  
signal; and

in the step b.2), the extracted control information  
is inserted into the first location.

26. The data transfer method according to claim 22,  
15 wherein bytes that are not used in the transmission signal are  
assigned to the DCC transmit bytes. .

27. A program instructing a computer of a data  
transmission equipment to forward control information, wherein  
the data transmission equipment works in a predetermined  
20 communication protocol, comprising the steps of:

- a) receiving a transmission signal including  
control information at a receiving section from upstream;
- b) forwarding control information included in a  
received transmission signal to a transmitting section without

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controlling the control information according to the  
predetermined communication protocol; and

c) transmitting a transmission signal including the  
control information from the transmitting section to

5 downstream.

28. The program according to claim 27, wherein the step  
b) comprises:

b.1) extracting the control information from the  
received transmission signal; and

10 b.2) inserting the extracted control information  
into a predetermined one of a first location and a second location  
of the transmission signal to be transmitted.

29. The program according to claim 28, wherein the first  
location is data communication channel (DCC) bytes of the  
15 transmission signal and the second location is DCC transmit  
bytes that are previously determined in the transmission signal.